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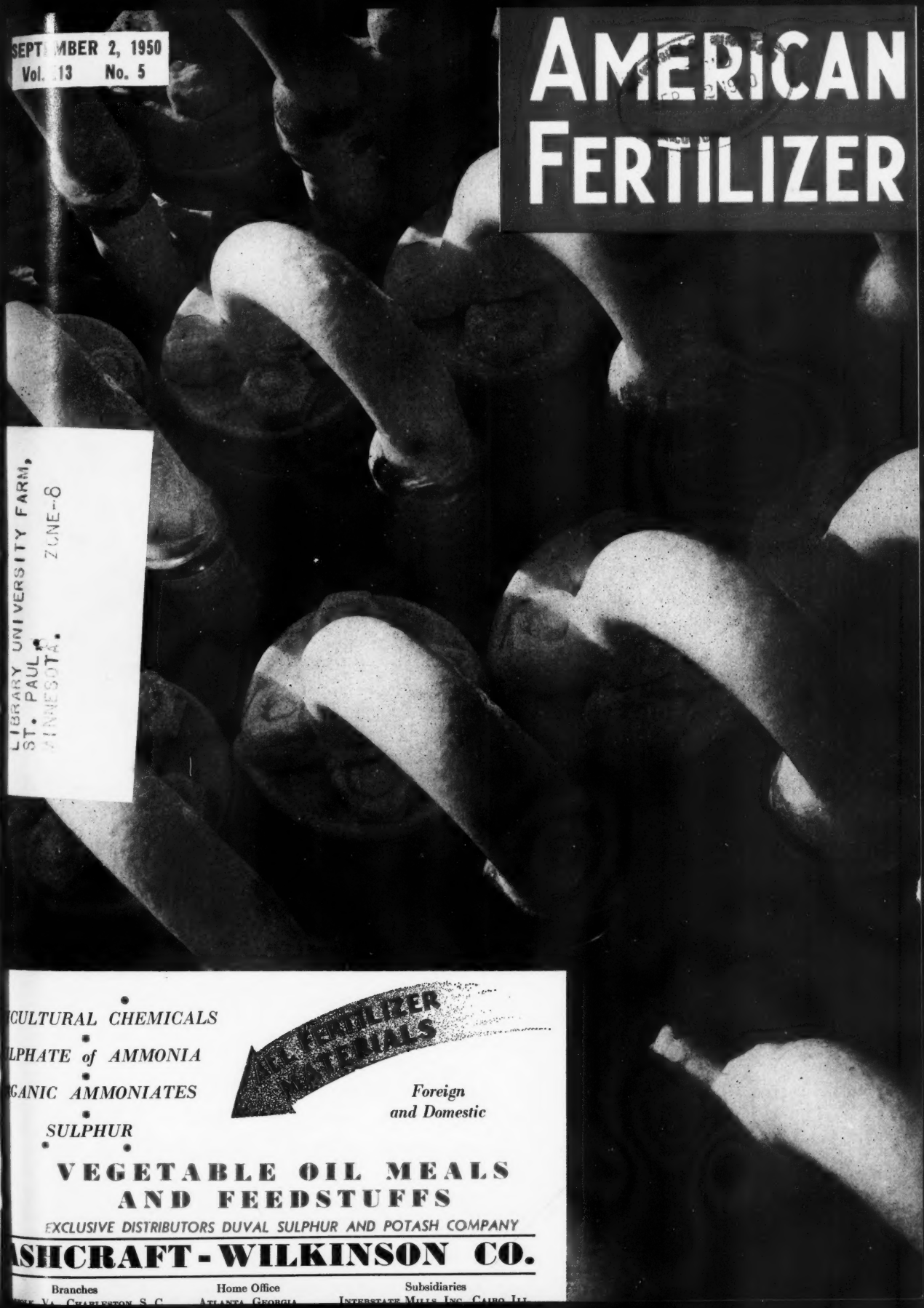
AMERICAN FERTILIZER



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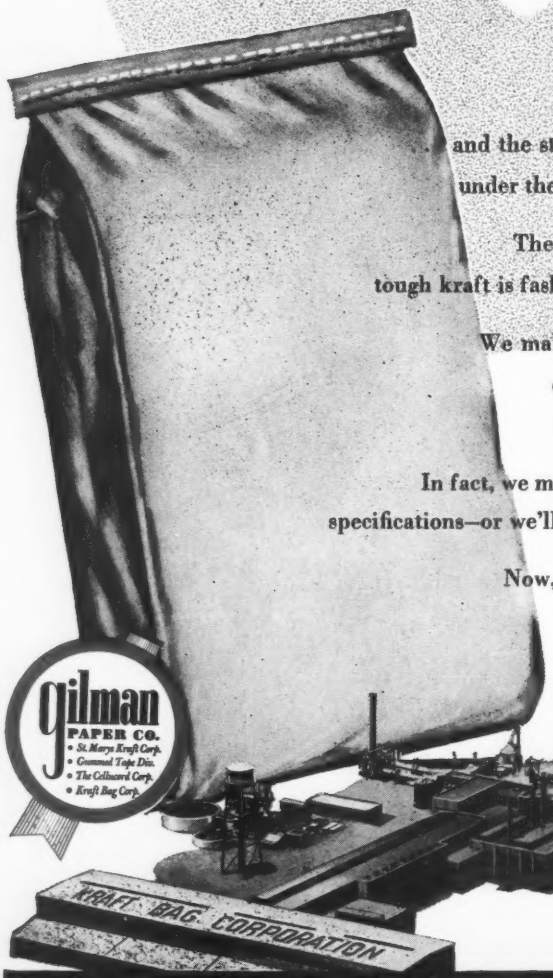

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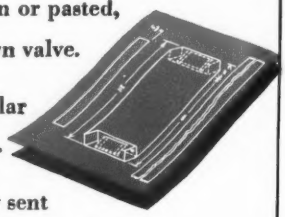

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AMERICAN FERTILIZER

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AMERICAN FERTILIZER *is not necessarily in accord with opinions expressed in contributed articles that appear in its columns*

Vol. 113 SEPTEMBER 2, 1950 No. 5

Table of Contents

THE COVER: *It is a far cry from the relatively simple fertilizer manufacturing processes of the 19th century to the intricate machinery used today. The rather "futuristic" photo shown on the front cover was taken in the nitrogen fixation plant of the Spencer Chemical Company at Pittsburg, Kansas.*

EDITORIAL

WORLD FERTILIZER OUTLOOK

Now that civilization has divided into two armed camps and Wendell Willkie's concept of "One World" has been shown to be a goal attainable only in the distant future, it is a pleasure to record the achievements of one body that is obtaining real international cooperation. In the gathering of fertilizer statistics, the Food and Agricultural Organization of the United Nations is rendering a very useful service to our industry throughout the world.

Their report, issued on August 10, shows that the world use of fertilizer is increasing in a very encouraging manner. According to their figures, the year 1950–1951 will see 13,446,000 tons of plant food consumed in all countries, exclusive of U. S. S. R., an increase of 8 per cent over the 12,414,000 tons used in 1949–1950. The former figure includes 3,887,000 tons N, 5,648,000 tons P_2O_5, and 3,911,000 tons K_2O. The increases are expected to be the greatest in those parts of the world where present food production is not adequate for the population.

"The present is an important period of transition in the world production and consumption of commercial fertilizers," the report says. "For the first time since the war, world supplies of most fertilizer materials are now sufficient to meet effective world demand. Because countries can now plan crop production programs on a broader base of available fertilizer supply, their agronomic needs can be better satisfied. While, however, shortage of supply is no longer a major factor in limiting the expansion of fertilizer consumption, other factors are exerting an adverse influence in some countries.

"Factors other than supply are causing a slowing down of demand for all fertilizers. Less favorable relationships in some areas between agricultural and fertilizer prices are an important adverse influence. The inability to finance purchases because of monetary and financial considerations has kept some countries from fully meeting their import requirements. It is expected that during 1950/1951 such factors will tend to exert more influence than will agronomic needs or the status of the world's supply on the amount of commercial fertilizers consumed.

"While the world outlook for 1950/1951 is for an approximate balance between supply and effective demand, the plant nutrient supply available in many countries is still inadequate to meet the needs of desirable crop and food production. At the same time, available plant capacity in some areas could produce larger tonnages of fertilizers if required. The determination of conditions under which the use of commercial fertilizers may be profitable, especially in the more underdeveloped countries, and the wider dissemination of such knowledge are two of the most important factors in the profitable use of the more abundant world supply."

THE USE OF

Minor Elements

IN FERTILIZERS*

YOU HAVE JUST BEEN TOLD that our plants require and remove many chemical elements from the soil. Man has arbitrarily divided these into two major groups for fertilizer consideration. The list with which most fertilizer workers are concerned is called the major, macro, or primary group. It consists of nitrogen, phosphorus, potassium, calcium, magnesium, sodium, sulphur, aluminum, and silicon. These major elements are found in the soil and removed by the plants, and are returned to the soil in fertilizers and organic materials in rather large quantities. A second list of essential nutrients is called the minor, micro, or secondary group. This group is found in the soil and required by plants in small quantities—hence, are called minor elements. You have been told that this group includes boron, manganese, copper, zinc, and molybdenum. There are, however, many who believe this list should be enlarged to include all elements which have stimulated or increased plant growth. Those of you who attended the minor elements, vitamin, and hormone conference in Madison, Wisconsin, this past summer heard two of the nationally known speakers say they would not omit any of the inorganic elements obtained from soil minerals in their list of needed elements. This would enlarge the number of micro-nutrients needed for plant growth several times.

At the present we know a little of the role a few of these elements play in plant growth. This has already been briefly explained to you. Until we know the exact function or role of each element, there will always be a controversy over the list of essential micro-nutrients. The trend of present thinking on this subject seems to explain the role of most inorganic nutrients as that of catalysts. These elements are taken in largely through the plant roots and carried up to the active or growing cells. The active or growing cell, with the aid of these nutrients, absorbs the part of the solar spectrum which its specific structure permits. This absorbed energy aids the plant cells in their manufacture of the many different plant foods such as sugars, starches, carbohydrates, proteins, etc. Since each element or catalyst has its own absorption band or wave length, the absorption of a large enough portion of the spectrum to supply the needed energy for life and growth would require a large number of the inorganic elements. This theory helps explain why one element cannot substitute for another in plant growth. As our technic in isolating and determining chemical elements improve, more new elements are found to be essential to plant growth or for the manufacture of plant food. This is also supporting evidence for the catalyst theory. Perhaps some day the exact catalytic function of each element will be known and guesswork in regard to fertilizer requirements of each plant and soil will be eliminated. A fertilizer may then have to supply fifty or more elements instead of four or five major and a few micro-nutrients, as it does at this time.

Under natural conditions our soils have built up or accumulated most of the available plant nutrients in the surface soil layers, i.e., the root zone or plow layer. This development or stocking of this surface layer or plant nutrient storehouse took place over a long period of time. Millions of roots penetrate the various parts of the soil profile to secure these nutrients. When these roots and their respective top portions died, the residues were returned to the soil where they were decomposed and gradually worked into the surface part of the soil. In this manner a good soil with a limited supply of nutrient could develop from soil material containing a limited supply of these needed micro-nutrients. When those stored elements are used by plants and removed from the soil, deficiency symptoms occur.

WHEN the white man started farming the soil of this country, he found a good soil storehouse of nutrients which had developed from centuries of accumulation. Consequently these soils produced good crops for him. Unfortunately, he failed to realize the necessity of replenishing this storehouse and it became depleted by crop removals, destruction of organic matter and accelerated leaching. All this resulted in compact soil structure, poor physical conditions, low organic matter content, unbalanced and often undesired biological activity, accompanied by a nutrient depleted fertility condition. To offset this depleted and unfavorable condition man resorted to the use of fertilizers. At first these fertilizers were not much more than crude carriers of the three important major elements. As time passed, man has gradually made the fertilizers more soluble and of greater concentration of these major ele-

*One of several papers in a minor element symposium presented at the yearly fertilizer manufacturers' and dealers' conference held at the University of Maryland, College park, Md., February 23, 1950.

By R. P. Thomas

• Market Survey Specialist, International Minerals & Chemical Corporation, Chicago, Ill.

ments. This reduced the amounts of impurities, or the usual carriers of small amounts of minor elements in our fertilizers. At present our soils are receiving less and less micro-nutrients while more are being removed from them. Over a period of time, due to such practices, our soils' need for micro-nutrients has increased. In many soils this need is critical. In most cases, our fertilizer should carry many of these micro-nutrients.

In order to meet this increased need for micro-nutrients, they have been added to fertilizers in various ways. Usually this has been in a water-soluble form, so the need could be quickly satisfied. With many of these micro-nutrients a few ounces per acre is all that is needed. Greater amounts than required usually cause toxic conditions and limit crop growth. It is almost impossible to mix satisfactorily a few ounces of several of these micro-nutrient salt carriers in a ton of fertilizer so that only the needed amount will come into contact with plant roots and micro-organisms. If there is an inadequate amount available to the plant, little growth or benefit will be noted. Likewise, only a slight excess may be very injurious to the plant. A few experiences with injurious results to plants, or apparent lack of response, make both the agricultural experiment station worker and the fertilizer producer hesitate in their recommendations of micro-nutrients for use with fertilizer. Consequently, many recommendations or suggestions regarding the use of micro-nutrients are so limited and careful that they do not include sufficient quantities to give the needed stimulation to crops. It is not strange, then, that many people have not found the use of micro-nutrients profitable. If micro-nutrients are applied, they should be in such a form and quantity that they will both supply the crop requirement and not produce injury to plants.

Crop Needs Vary

Another factor in micro-nutrient use in fertilizer is the crop itself. Crops vary considerable in their plant food make-up such as sugars, starches, carbohydrates, proteins, fats, etc. Since these foods are manufactured in the natural plant laboratory, the leaf, there are probably many combinations of the catalyst required by different plant leaves and even at different stages of the growth of the plant. Each species of plant and even varieties within a species could and probably do require different amounts of micro-nutrients or catalyst to synthesize the particular food made by that plant. Plants differ in their root habits, leaf size, length of growing period, growing temperature, etc. Any and all of these could easily affect the micro-nutrient need. Usually the plants that make the most rapid growth have the largest leaf area, and at the same time have the higher micro-nutrient need. Perhaps they may need more of these micro-nutrients so as to better utilize more of the solar energy for greater food production in a shorter period of time.

Our soils contain billions of micro-organisms which are really miniature plants. These organisms have micro-mutrient needs similar to those of their cousins which you see growing in our soils. These micro-plants are usually not able to utilize solar energy as are the green leaf plants. Instead, they utilize the energy and food stores in the plant materials and organic matter in the soil. These micro-organisms are essential to good soil tilth, productivity, structure sanitation, and plant disease control. Very little is known about the micro-nutrient requirement of these millions of miniature plants. There are many indications that these micro-organisms respond just as differently to the micro-nutrients as our economic plants. In that case a variation in micro-nutrients could greatly affect the micro-organism species and population. In turn their variation could greatly affect the productivity level, soil structure and even plant diseases. These are many examples where the use of micro-nutrients has caused increases in productivity, improvement in soil structure, and control of plant diseases. The micro-nutrient need of soil organisms may be much greater and even radically different from the plants growing on the soil.

Soil Conditions Vary

The soil itself may influence the crop response to micro-nutrients. Some soils through their chemical, biological and physical make-up affect the reaction of micro-nutrients. In some soils the water-soluble salts of the micro-nutrients are made insoluble very rapidly, and in other soils there is little change in the solubility of the same salt. Under such conditions, deficiencies may not be corrected though the minor element has been added. Sometimes the secondary products formed by reactions of the micro-nutrients salts within the soil produce unsatisfactory conditions for plant growth. Each time a new micro-nutrient or a new combination of macro- and micro-nutrients is added to a soil, there is created a set of new conditions which may change the fertility balance of a soil. Often these new conditions produce unique problems in crop production. Usually the more soluble the salt, the more likely it is to cause such a disturbance within a soil or bring about an unbalanced physiological condition.

Some of the strongest critics of

(*Continued on page 28*)

American Chemical Society

FERTILIZER PAPERS

At the annual meeting of the American Chemical Society, to be held in Chicago on September 4, 5, and 6, the Division of Fertilizer Chemistry will present a program of 16 scientific papers on various phases in the fertilizer field. Through the courtesy of Vincent Sauchelli, chairman, and S. F. Thornton, secretary of the Division, we present abstracts of some of the papers to be presented. The program for the three-day meeting appeared in our August 5th issue.

Price Relationships of Certain Nitrogen Fertilizer Materials

A. L. Mehring and Gae A. Bennett, Division of Fertilizer and Agricultural Lime, Bureau of Plant Industry, Soils, and Agricultural Engineering, United States Department of Agriculture, Beltsville, Md.

The domestic use of free ammonia in the manufacture of commercial mixed fertilizers began in 1927. Solutions of solid nitrogen compounds in water and ammonia were introduced in 1932. At present such solutions containing either ammonium nitrate or urea are widely used.

Since 1927 liquid forms of N have been cheaper than solid ones in making mixtures at most points in the United States, but not at all points in every year. In 1944 the difference in delivered cost began to increase and continued to a maximum in the spring of 1950. During the 1949 season liquid N was $1.40 a unit cheaper than ammonium sulphate N delivered at some points in the Southeast and 90 cents or more per unit at almost all points in the United States, except on the Pacific Coast. In Los Angeles, the point of minimum difference of those studied, liquid N was 57 cents per unit cheaper.

These price differences have contributed to greatly increased usage of solutions in fertilizer manufacture. In the year ended June 30, 1949, the quantity of free ammonia thus used was 170,000 tons, equivalent to three per cent of the superphosphate.

Fundamental Factors Influencing the Composition of Tomato Puree

Jackson B. Hester, Campbell Soup Co. Experiment Station, Riverton, N. J.

During the past twelve years, hundreds of twenty-five-pound samples of tomatoes from soil fertility plats have been processed, canned, and analyzed for sugars, vitamins, minerals, and other quality factors. The data reveal that vigorous growing, healthy plants produce highest quality whereas plants deficient in nitrogen, potash, magnesium, and others produce lower quality.

Compound Fertilizers from Rock Phosphate, Nitric and Phosphoric Acids, and Ammonia

E. C. Houston, T. P. Hignett, and R. E. Dunn, Tennessee Valley Authority, Wilson Dam, Ala.

A process was developed in which rock phosphate is treated with mixed nitric and phosphoric acids; the resulting solution is ammoniated and then dried to produce a fertilizer material containing dicalcium phosphate and ammonium nitrate. Addition of muriate of potash during processing is optional and produces an N-P-K fertilizer. The proportions of N-P_2O_5-K_2O in the product are variable over a wide range; compositionspreparedinclude 12–35–0, 19–19–0, 11–22–11, and 15–18–10. The proportion of P_2O_5 that is in a water-soluble form ranges from about 8 to 50 per cent. A major portion of the experimental product that was made was 17–22–0, containing 10 per cent of the P_2O_5 in water-soluble form and 95 per cent or better in citrate-soluble form. All steps in the process were developed for continuous operation in a four-ton-per-day pilot plant. The products showed up favorably in tests of crop response, storage, and drillability. Estimates indicate the process to be economically attractive.

Observations on the Fertilizer Industry in the United Kingdom, Netherlands and Norway

K. G. Clark and John O. Hardesty, Division of Fertilizer and Agricultural Lime, Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Md.

Modernization of the fertilizer industry in the United Kingdom dates from the late 1930's at about the time operation of the Oberphos process for producing granular superphosphate was discontinued and attention was directed to the preparation of granular mixtures. The outbreak of war in 1939 provided an additional incentive for the development of granulation processes since in any event the industry was faced with mechanization of many of its operations in order to produce with a smaller labor force the increased tonnages of mixtures in good physical condition required by the war effort. Installation of granulation equipment has progressed at an accelerated rate since the war—largely as a result of customer demand—until it is estimated that 75 per cent of the mixtures marketed this year will be in granular form. The pro-

portion of granular to powdered mixtures is expected to increase further in the next few years. At present superphosphate is marketed in powdered rather than granular form.

The number of different mixtures is quite small in comparison with United States practice and comprises four National compounds—7-7-10½, 9½-7-4½, 6-12-0, and 4-15-0—and a few other grades produced under special license In general, not more than three active ingredients—ammonium sulphate, superphosphate, and muriate of potash—are used in formulating these mixtures. Ammoniation of superphosphate or of mixtures is not practiced since credit can only be taken for water-soluble P_2O_5.

The industry in the Netherlands and in Norway treats phosphate rock with nitric acid to produce calcium nitrate and a 20-20-0 mixture of dicalcium phosphate and ammonium nitrate. The Netherlands industry also granulates superphosphate and N-P-K mixtures.

None of the three countries utilize urea for fertilizer purposes, or market ammonium nitrate for fertilizer use in preparations containing more than about 20.5 per cent nitrogen.

The Story of Gypsum

Walter S. Hamme, Manager, Agricultural Department, National Gypsum Company, Buffalo, N. Y.

This paper covers in broad outline a material of which some ten million tons is used annually in this country, yet about which singularly little is known even by the average user. It deals with the probable origin of gypsum; its occurrence in the United States and the various forms in which it is found in nature.

It gives the chemical composition of gypsum; its properties and behavior, and the particular characteristic, unique among the nonmetallic minerals, that accounts for its widespread use by various arts and industries.

It describes the methods of recovery and subsequent processing of the raw material. It outlines the part that gypsum plays in the chemical, agricultural and general industrial fields, as well as its more widely known use as a building construction material.

Gypsum: Past, Present and Future Use as a Fertilizer

Emil Truog, Professor of Soils, University of Wisconsin, Madison, Wis.

Gypsum, if it may be called such, was the first fertilizer to be marketed extensively on a commercial basis. Shortly following the beginning of the nineteenth century, about 100,000 tons of this material were being imported annually into the United States. Presumably, most of this was applied to soils. The rise and fall in the use of gypsum as a fertilizer presents an interesting story.

It is generally believed that Benjamin Franklin, following his observations in France, introduced the use of gypsum as a fertilizer in this country, particularly for clover and alfalfa. For about 100 years thereafter, gypsum (often called land plaster) was applied quite extensively by many farmers to their clover fields in the northern humid states. However, by about 1900, this use had largely ceased. What was the reason? Undoubtedly greatly increased additions of sulphur to the soil via precipitation, made possible by the burning of coal in tremendous amounts, has been a potent factor in this connection. Then, also, the extensive use of superphosphate and sulphates of ammonia and potash have furnished large amounts of sulphur. Superphosphate and lime have provided more calcium.

What about the future? Should the energy and heat now provided through the burning of coal be largely replaced via atomic energy and other fuels and means, then the present main source of sulphur supply for soils would be largely cut off. Substitution of the more concentrated forms of phosphate fertilizers for superphosphate will greatly reduce present additions. In all of these considerations, it should be recognized that the supply of sulphur in soils is no greater than that of phosphorus, that crops use nearly as much sulphur as phosphorus, and that sulphur is subject to severe leaching from soils.

Calcium Sulphate in Superphosphate; A Source of Calcium and Sulphur Nutrient

Vincent Sauchelli, The Davison Chemical Corporation, Baltimore, Md.

Crop production being a chemical manufacturing process, it is proper for investigator and farmer to predetermine the requirements in pounds per acre of each essential plant nutrient in order to reach the crop goal. Agronomists recognize the need of at least 14 chemical elements to grow normal healthy plants. Calcium and sulphur are among this group.

Gypsum, or dihydrate calcium sulphate, has been used in agriculture since ancient times; but not until chemistry established the mineral basis of plant feeding was it possible to understand why gypsum was beneficial.

Normal superphosphate contains about half its weight in calcium sulphate which is a source of available calcium and sulphur plant nutrients.

The results of many agricultural experiments both in the United States and abroad have established the essential character of calcium and of sulphur as plant nutrients. Experimental evidence has also been accumulated to show that calcium sulphate, in the anhydrous and hemi-hydrous forms existing in superphosphate, is a good source of calcium and sulphur nutrients.

The leached soils of humid regions are acid and deficient in calcium and to a less extent in sulphur. Liming such soils is perhaps more beneficial because it supplies calcium than for correcting acidity. Most crops can tolerate considerable soil acidity but not a serious calcium deficiency.

Advocates of the use of concentrated phosphates in place of normal superphosphate should consider the available calcium and sulphur of

(*Continued on page 28*)

WEEDS CAN BE KILLED

By Roy L. Lovvorn*

THE American people are lovers of gadgets and labor-saving devices whether in the home, in the machine shop, or the field. The same characteristic expresses itself in the elimination of weeds. Any cheaper or faster way to control weeds appeals to every member of the plant food industry who is interested in easier or more complete control of the weed problem in American agriculture. Weeds compete with crops for moisture, nutrients and light, and yields are reduced even under the best cultural management which may indirectly affect plant food sales. Weed control is as old as the simplest hoe. Chemical weed control is not new but it received a big boost a few years ago with the discovery of the behavior of certain so-called growth regulating substances. The 13 North Central States treated approximately 15 million acres with 2,4-D for weed control in 1949 and it is reasonably safe to say that four-fifths of this area was in growing crops at the time of application.

Interest in weed control is not confined to growers of field, vegetable, or fruit crops. Plant food manufacturers have a vital interest in weeds. Pastures are improved when weeds and brush are killed by the newer herbicides and ranges are renovated in an unprecedented way. Irrigation ditches in the West must be kept free of weeds that restrict the flow of water to the fields; this applies to the weeds on the bank as well as the aquatic ones in the beds of the ditches. Certain poisonous weeds are always a menace to livestock and they may cause serious losses and railroad and highway rights-of-way are cleared more economically with chemicals than with the bush ax. Powerline rights-of-way need vegetative cover to prevent erosion, but woody brush and trees must be destroyed or checked because they interfere with inspection and maintenance of power lines.

The damage from weeds that choke out crops, over-run pastures, and deplete fertile soil can be extimated in the millions. All of the plant food manufactured can not win the fight against weeds without help from experts and their chemical control.

ANSWERS to many of the situations outlined in the preceding paragraphs are now known while others are unanswered but progress is being made. Industry, represented by farm machinery, pesticide and herbicide manufacturers, is doing a great deal of research toward the solution of weed problems. Most of the State Agricultural Experiment Stations have increased their weed research personnel; many states now have extension weed specialists and some states have excellent control or regulatory departments. The Division of Weed Investigations of the Bureau of Plant Industry, Soils, and Agricultural Engineering, of the United States Department of Agriculture was an outgrowth of the weed project in the Division of Cereal Crops and Diseases, and cooperates with other federal agencies as well as the state experiment stations in attempting to lick weed problems. This cooperation is particularly active with the Bureau of Reclamation of the United States Department of the Interior, in working on the Federal irrigation projects of the West. Demands for information on weed control often reach beyond the established facts, and as a result many fertilizer salesmen, dealers and allied trades members may be in a state of bewilderment as to what to recommend. Now that the knowledge of weed control methods is being increased rapidly, one can make recommendations with more confidence than heretofore. Recommended suggestions would be as follows: (1) Fertilizer manufacturers and salesmen should utilize your State weed men fully. They know your problems and often are in better position to give specific recommendations for the local needs in chemicals than any specialist located in some other part of the country. (2) Include some weed control demonstrations in your educational and promotional work; your competitor will. (3) If your State does not have a weed control conference, suggest to your State Department of Agriculture that one be organized. (4) Chemical weed control is not a substitute for good farming practices. Herbicides and insecticides are not the only tools for combatting weeds.

Doubtless many farmers and home-owners in your locality are using allied chemicals to control different kinds of weeds and brush. Look up some of these people and find out which kinds of plants were killed or injured. What grew in the spaces where weeds died? Ascertain the kind of chemicals that were used, the dosage applied, the time of application, the weather that followed the stage of growth of the weeds and crops. All of these facts will help in formulating local mixtures of insecticides and fertilizers.

*Head Agronomist in Charge, Division of Weed Investigations, Agricultural Research Administration, U. S. Dept. of Agriculture.

Respirators For Parathion Users

A list of approved-type respirators to provide inhalation protection from dusts or mists of parathion insecticides has been issued by the United States Department of Agriculture.

Parathion is one of the newer insecticides. It has been found to be dangerous to the user under certain circumstances. Fruit growers and others who do apply parathion are urged to use an approved-type respirator over their face. The respirators suggested have been tested by the U. S. Department of Agriculture. Write your local County Agent for the list.

Commercial Solvents Names Three New Directors

Henry V. B. Smith, Partner of H. J. Baker & Bro., Leroy A. Lincoln, President of the Metropolitan Life Insurance Company, and Arthur B. Lawrence, Senior Partner of F. S. Smithers & Co., have been elected to the Board of Directors of Commercial Solvents Corporation, it has been announced by Major T. P. Walker, Chairman of the Board.

Mr. Smith is also a Director of Wilson & Toomer Fertilizer Company and the Southern States Bag Company, Jacksonville, Fla.; and of Anderson Fertilizer Company, Anderson, S. C.

In addition to his activities in the insurance and law fields, Mr. Lincoln is a member of the Board of Directors of Chase National Bank, Home Insurance Company, Union Pacific Railroad, and Avco Manufacturing Corporation.

Mr. Lawrence is a Director and a member of the Executive Committees of Continental Oil Company, Reynolds Spring Company, and Pocahontas Fuel Company, Inc. He is also a Director of Campbell, Wyant and Cannon Foundry Company, and Hayes Industries, Inc.

H. V. B. Smith

International Minerals to Build New Texas Fertilizer Plant

International Minerals & Chemical Corporation has completed negotiations for purchase of a site in Fort Worth, Texas, from Consolidated Chemical Industries, Inc., upon which will be erected a new chemical fertilizer plant, according to announcement by Maurice H. Lockwood, vice president in charge of International's Plant Food Division. The site on Fort Worth's north side has an area of approximately thirty acres, and is adjacent to the plant of Consolidated Chemical Industries, Inc., which will be the source of supply of sulphuric acid used in International's manufacture of superphosphate at Fort Worth.

The new plant, when completed, is expected to represent an investment of approximately $500,000 in land, buildings and equipment, and have a capacity of 40,000 tons annually. The products of the plant, in addition to superphosphate, will include mixed fertilizers used in growing wheat, hay, corn, cotton, truck and pasture crops.

Bids for the plant now are being obtained and the starting time of construction will be announced in the near future.

Bids Asked on Florida Phosphate Leases

The Bureau of Land Management, U. S. Department of the Interior, is requesting bids on the leasing of 130 acres of phosphate land in Florida.

Two tracts, one of 80 acres in Citrus County, 4 miles southwest of Inverness, Florida, and one of 50 acres in Hernando County, one mile west of South Catherine, Florida, are offered at a minimum bid of $25 on each tract to qualified bidders of the highest cash amount per acre as a bonus for the privilege of leasing.

Information about the above properties and the conditions of bidding can be obtained from the Bureau, at Washington, D. C.

Sealed bids marked "phosphate lease" should be mailed on or before 1 p.m. EST, October 4 to the Director, Bureau of Land Management, Washington 25, D. C. Each bidder must submit with his bid a certified check, money order or cash for one-fifth of the amount bid by him and file evidence of his qualifications to receive a lease.

Royster to Build New York State Plant

F. S. Royster Guano Company has announced the award of a contract to the McCloskey Company, of Pittsburgh, Pa., for the construction of a dry-mixing plant at Lyons, N. Y. The new plant, located on the main line of the New York Central Railroad and the New York State Barge Canal, will have a capacity of 15,000 to 20,000 tons.

At present, orders in the New York district are filled from their Baltimore plant. While the Baltimore office will continue to handle sales matters, the new plant at Lyons will enable the company to give better service to their growing business in the Central New York State area.

Consolidated Enlarging

Announcement is made by the Consolidated Mining and Smelting Company of Canada, Limited, that it plans to increase the electrical facilities of its chemical and fertilizer plants at Trail, B. C., at a cost exceeding $300,000.

Noble Advanced by A&S

Arkell & Smith, manufacturer of paper bags, recently announced the appointment of W. E. Noble as assistant to Howard C. Peterson, Jr., General Sales Manager. Mr. Noble studied Business Administration at New York University and was formerly associated with the Borden Company. His headquarters are at Canajoharie, N. Y. where he will coordinate the customer service and market development work of the A&S sales department.

The average vacation tan costs at least a dollar a square inch.

Manners are the happy ways of doing things; each one a stroke of genius or of love, now repeated and hardened into usage.

POTASH OUTPUT INCREASING

Institute Reports Higher Tonnage for First Half of 1950

Potash deliveries during the second quarter of 1950 in North America by the five major American potash producers and three importers totaled 693,247 tons of potash salts containing an equivalent of 392,687 tons of K_2O, a new high, the American Potash Institute announced. It represented an increase of 16 per cent in salts and 21 per cent in K_2O over the tonnage delivered during the corresponding period in 1949. Imports comprised 57,044 tons K_2O in the above and included those from France and Western Germany during the entire first half of 1950. Deliveries for agricultural purposes in the United States, Canada, Cuba, Hawaii, and Puerto Rico (Institute countries) amounted to 652,939 tons of salts equivalent to 367,820 tons of K_2O, consisting of 331,007 tons as muriate, 2,086 tons as manure salts, and 34,727 tons as sulphate of potash and sulphate of potash-magnesia. Deliveries for chemical purposes amounted to 32,896 tons of salts, equivalent to 20,402 tons of K_2O. Exports to other than Institute countries totaled 4,465 tons K_2O.

During the first six months of 1950, total North American deliveries including imports amounted to 1,115,737 tons of salts containing an equivalent of 633,256 tons K_2O. This represented a decrease of 4 per cent in salts and an increase of 2 per cent in K_2O over the same period in 1949. Deliveries of potash for agricultural use in Institute countries totaled 1,037,391 tons of salts with an equivalent of 584,923 tons of K_2O, a decrease of 6 per cent in salts and an increase of 1 per cent in K_2O over last year. Making up these agricultural deliveries were 530,499 tons K_2O as muriate, 2,788 tons K_2O as manure salts, and 51,643 tons K_2O as sulphate of potash and as sulphate of potash-magnesia. The chemical industries took 62,877 tons of potash salts containing an equivalent of 39,034 tons of K_2O, a 16 per cent increase over the first half of 1949. Exports to other than Institute countries amounted to 9,299 tons K_2O, an increase of 52 per cent over last year.

NORTH AMERICAN POTASH DELIVERIES

SHORT TONS K O

	Jan.–June 1950	*Jan.–June 1949*	*April–June 1950*	*April–June 1949*
Muriate	530,492	509,786	331,007	273,298
Manure Salts	2,788	33,427	2,086	14,985
Sulphate and Sul. Pot. Mag.	51,643	35,807	34,727	18,024
TOTAL AGRICULTURAL	584,923	579,020	367,820	306,307
Exports	9,299	6,103	4,465	2,975
Chemical Grades	39,034	33,649	20,402	16,452
GRAND TOTAL	633,256	618,772	392,687	325,734

July Tax Tag Sales Increase

A tally of tax tag sales and fertilizer shipments in nine Southern and three Midwestern States reveals that the equivalent tonnage of fertilizer covered by these figures in July was about six per cent higher than in the same month of last year. These figures, which are compiled by The National Fertilizer Association, show that in the Southern States for which data are available, sales were 16 per cent above those of July 1949, while the Midwest States registered a drop of approximately one and one half per cent.

It will be noted that the July, 1950, figures for North Carolina and Oklahoma are not included in the table below. New reporting procedures in these States make it impossible to obtain figures for any given month before the end of the following month. In other words, July tonnage figures for North Carolina and Oklahoma will not be available until early in September.

FERTILIZER TAX TAG SALES AND REPORTED SHIPMENTS

(In Equivalent Short Tons)

Compiled by The National Fertilizer Association

	July	
State	*1950*	*1949*
Virginia	8,000	10,331
N. Carolina	—	7,653
S. Carolina	7,720	8,773
Georgia	7,166	6,522
Florida	47,297	35,808
Alabama	32,285	27,052
Tennessee	15,024	11,285
Arkansas	13,441	12,255
Louisiana	4,646	5,542
Texas	15,151	12,162
Oklahoma	—	6,280
Indiana	101,575	126,239
Kentucky	17,966	18,076
Missouri	42,655	20,198

FERTILIZER MATERIALS MARKET

NEW YORK

Production of Most Materials Continues in Balance with Shipments. Fertilizer Organics Scarce but Decline of Feed Market Prices Brings More Materials in Fertilizer Range.

NEW YORK, August 30,1950

Sulphate of Ammonia

Some of the leading producers report that their orders and their production are about in balance for the first time this year and stocks are shipped out as fast as made. No price changes were noted. Some large export inquiries are still in the market.

Nitrate of Soda

There has been no change in price for some time and shipments are being made in a routine manner. Stocks are ample at most points.

Ammonium Nitrate

Material for quick shipment was hard to locate and demand has been excellent from various directions. No price changes were noted.

Nitrogenous Tankage

This material is in a very strong position marketwise, with offerings for shipment over the balance of the year difficult to locate. Most producers are sold out for the next year and some are being forced to allocate their available tonnage.

Castor Pomace

This material is in a strong position with no offerings at present. Last sales were made some time ago at $32.50 per ton, f.o.b. production points. Buyers are anxious to cover for the forward months.

Organics

Some organic fertilizer materials displayed an easier tone, due to lack of buying by the feed trade. Blood and tankage were quoted at $7.75 per unit of ammonia ($9.42 per unit N), f.o.b. Eastern shipping points, but sales were actually made under these figures. As the price goes down, the fertilizer buyers are showing more interest due to the strong position of other organic materials. With a big crop of soybeans in sight this fall, the price of this material has declined recently and last sales were made on the basis of $56.00 per ton in bulk, f.o.b. Decatur, Ill. Linseed meal was quoted at $65.50 per ton in bulk, f.o.b. eastern production points. Cottonseed meal maintained a firm tone on account of the expected short cotton crop this season.

Fish Meal

Little trading was reported in this material and the market was nominally considered to be $130.00 to $135.00 per ton, f.o.b. fish factories. Imported material is still offered for shipment from abroad at prices under the domestic material but buyers seem to prefer the domestic menhaden fishmeal.

Bone Meal

Prices have recently advanced and some producers are sold out for nearby shipment. The demand from the feed trade is exceptionally good, with numerous offerings of imported material reported.

Hoof Meal

Last sales were made on the basis of $7.00 per unit of ammonia ($8.51 per unit N), f.o.b. Chicago, and the demand has been good from the fertilizer trade.

Low Grade Organics

Due to the firmness of castor pomance, nitrogenous and other similar materials, low grade organics are in demand on a wide scale.

Superphosphate

No great change is reported in this material but stocks are not large at several large production points and any unexpected demand might be hard to fill for quick shipment.

Potash

Buyers are showing interest in this material and producers are making shipments against existing contracts. Quite a bit of export inquiry is noted to various countries. From time to time some German potash has been offered but no actual sales have been reported.

PHILADELPHIA

Adequate Supplies of Most Materials. Organics Prices Lower. Shortage of Sulphuric Acid.

PHILADELPHIA, August 30, 1950

While there is considerably more than seasonal interest in materials, and production of raw fertilizer materials is at full capacity, there is no serious scarcity—except possibly in domestic nitrate of soda and sulphuric acid. Blood and tankage are considerably lower in price and buying interest is lacking. Indications are that deliveries of all materials will be more evenly distributed over the coming months.

Sulphate of Ammonia—Production is meeting requirements and prices remain unchanged. Output is principally under contract.

Ammonium Nitrate—Production is heavily under contract with the supply position rather tight. Prices are unchanged. Good demand.

Nitrate of Soda—While stocks are sufficient to meet present demand, domestic production is hampered by strikes which have interrupted supply of essential raw materials.

Blood, Tankage, Bone—The blood and tankage market has weakened materially and sales have been made at $7.00 per unit of ammonia ($8.51 per unit N). Bone is in fair

demand at $57.50 to $62.50 per ton, depending upon the grade.

Castor Pomace—Nothing in this line is being offered at the moment.

Fish Scrap—The market is easier and not much buying interest is evident. Menahden meal is quoted at $135.00 and scrap $127.50 per ton.

Phosphate Rock—Market remains steady and shipments continue against contracts. Supplies are quite ample to meet present requirements.

Superphosphate — Shipments are principally against contracts, but some acidulators are reported behind in deliveries due to shortage of sulphuric acid. No price changes are indicated.

Potash—Production is maintained at full capacity and shipments continue against contracts Some delay is being encountered, however, due to shortage of cars.

CHICAGO

Organics Market Slumps but Recovers Quickly. Demand Expected to Remain Steady.

CHICAGO, August 28, 1950

During the past two weeks the market in this area on animal ammoniates declined and recovered. At present it is in a firm position with a fairly broad demand and indications are that for the foreseeable future the market will remain steady or improve to some extent.

Ground and sacked meat scraps, as well as digester tankage, are generally held at $110.00 to $120.00 per ton, depending upon location. These prices are $3.00 to $5.00 per ton over buying interest but sellers refuse to make any concessions. Dry rendered tankage is in short supply and generally speaking, sellers' ideas are $2.00 per unit of protein with buyers endeavoring to purchase at $1.90 to $1.95 per unit without success.

Wet rendered tankage is quoted nominally at $8.00 to $9.00 per unit of ammonia ($9.72 to $10.94 per unit N), and dried blood is held at $7.75 to $8.00 per unit of ammonia ($9.42 to $9.72 per unit N) against last sales of $7.50. Steamed bone meal, 65 per cent B.P.L., is listed at $75.00 to $80.00 per ton and raw bone meal, 4½–45 per cent, at $70.00 to $75.00 per ton.

CHARLESTON

Materials Market Not Active. Shortage in Nitrogenous Tankage. Boxcar Situation Hampers Potash Shipments.

CHARLESTON, August 28, 1950

Organics—Although blood and tankage recently were slightly reduced, strength is being shown in the prices of these organics. Organics for fertilizer use are in relatively tight position as the major producers of domestic nitrogenous are sold up for several months ahead. Prices for nitrogenous tankage are nominally $4.00 to $4.35 per unit of ammonia ($4.86 to $5.29 per unit N), in bulk, f.o.b. production points. Offerings of imported nitrogenous are light.

Castor Pomace—The major domestic producers of castor pomace continue sold up through September, due to the difficulty in obtaining castor beans from Brazil. The prospects are that very limited quantities will be available over the coming months. Last sales were made at $32.50 per ton in bags, f.o.b Northeastern production points.

Dried Ground Blood—The Chicago market is reported at around $8.00 per unit of ammonia ($9.72 per unit N), for ground bagged blood. New York market is approximately the same.

Potash—Movement of domestic potash is hampered by boxcar shortages but no serious shortage has developed. Demand continues heavy with supply unable to completely fill the demand.

Ground Cotton Bur Ash—Last sales of 30/40 per cent K_2O material were made at 75 cents per unit of K_2O in bulk, f.o.b. Texas production point, for a limited quantity. Prospects are that the tonnage available for the new season will be considerably less than during the last season.

Phosphate Rock—The market is described as steady with movement regular against contracts. Prices continue firm.

Superphosphate—Movement is in normal dimensions to contract consumers and producers are in comfortable sales position. Prices are steady.

Sulphate of Ammonia—Prices continue unchanged and the market is firm. A considerable tonnage of nitrogenous fertilizers originally scheduled for Korea has been diverted to Formosa.

Ammonium Nitrate—The market is tight with production heavily under contract. Prices continue unchanged.

Nitrate of Soda—Supplies situation is comfortable and demand is seasonal. Prices continue the same.

Supplies of the prime ingredients, nitrogen, superphosphate, and potash, appear at this time to be sufficient to meet the expected demand, although potash demand and supply are not perfectly in balance. No unusual buying activity is noted among fertilizer manufacturers.

Chilean Nitrate Sales Appointments

J. F. Doetsch, President of Chilean Nitrate Sales Corporation, New York, announced the appointment of Fred P. Bryan as Assistant Sales Manager of the Corporation with headquarters at Raleigh, North Carolina; B. Frank Crumpler as District Manager for North Carolina, Virginia and West Virginia with headquarters at Raleigh, North Carolina; and Edwin Sterne, Jr., as District Manager for South Carolina with headquarters at Columbia, South Carolina.

J. S. Howard, District Manager at Columbia, South Carolina, is retiring after more than 20 years service with Chilean Nitrate Sales Corporation.

Communists don't really hate profits. What they hate is that Americans should have them, because profitable American industry is one of the obstacles to Soviet world dominance.

SULPHUR

*Interesting Facts Concerning This Basic Raw Material from the Gulf Coast Region

*MAN MADE MOUNTAINS

Sulphur from the field collecting stations is delivered to the vats through insulated pipe lines which discharge directly on the vats. The sulphur is pumped at such a rate that the height of the vat is increased only a few inches per day, the slight vertical rise being the result of a large horizontal area which provides maximum cooling surface and ample tonnage capacity. As the sulphur solidifies it gradually builds up into a great block or vat of solid sulphur, which may be as large as 1200 feet long, 50 feet high, and 200 feet wide, and containing as much as half a million tons of sulphur.

The discharge lines are placed so that the liquid sulphur is spread in an even layer over the entire surface of the vat and is permitted to solidify uniformly. If the liquid sulphur is introduced too rapidly or is not properly distributed, pockets of liquid sulphur will be covered by a crust and remain in the solid sulphur. The low heat-conductivity of sulphur might keep such pockets liquid for a year or more.

Loading operations at one of the huge vats of Sulphur at our Newgulf, Texas mine. Such mountains of Sulphur are constantly being built at our mines, from which shipments are continually made.

TEXAS GULF SULPHUR CO. INC.

75 East 45th St. New York 17, N. Y.

Mines: Newgulf and Moss Bluff, Texas

Davison Chemical Receives Safety Record Award

A 67 per cent reduction in accident frequency rate and a 50 per cent reduction in accident severity rate resulted in the Phosphate Rock Division of The Davison Chemical Corporation getting down to 22 per cent of its industry group average for frequency and 5 per cent for severity during 1949.

In the same year the Davison's Curtis Bay works achieved a frequency rate of only 16 per cent of the average for its industry, and a severity rate only 12 per cent of its industry average.

One result of these safety records was the presentation of two Distinguished Service To Safety awards by the National Safety Council on August 10th. Earlier the U. S. Bureau of Mines had sent the company a letter or commendation and awarded a certificate. Davison also received the largest returned premium ever paid by the Maryland Casualty Company to any company carrying policies of comparable size. The returned premium was in excess of $30,000.

The basic principle by which the records were achieved, reports Dr. G. M. Hebbard, vice-president of Davison, in charge of operations, was that of tracing every accident, no matter how slight, right down to its root causes. When a hazardous condition is discovered the company looks for the cause in management procedures first, in the design or operation of equipment second, in the methods of worker training third, and in the thinking and work habits of the workmen last. Good safety practices are interwoven with job training and instruction so that safety is made an integral part of the correct performance of every task. The management follows through with carefully detailed committee consideration of every accident and every hazard. One man is directly responsible for safety practices in each plant, no matter how large or small the plant may be. Executives and office personnel are as responsible for good safety practices in their habits and their places of work as are any other employees.

The Distinguished Service to Safety Award being presented by the National Safety Council to The Davison Chemical Corporation for safety record made at Curtis Bay works, Baltimore. From left to right: Chester F. Hockley, Davison Board Chairman and President; Governor W. Preston Lane, Jr. of Maryland; John S. Cuthbert, Eastern Representative of the Council; J. R. Mecredy, Works Manager of the Curtis Bay plant; and Theodore Hoover, President of Local No. 2, International Chemical Workers Union.

The safety executives in each plant are required to have cameras and to use them. Pictures are taken of hazardous conditions, corrective recommendations are made, then confirming pictures are taken of the corrected conditions. By use of these pictures and of accident report forms which lend themselves to tabulation, the company is able to reach a factual basis in regard to hazards. By use of the facts, the development of safety is turned into a true engineering operation.

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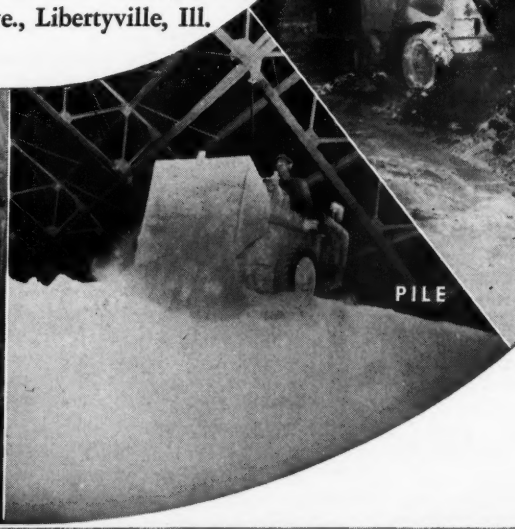
FOR THE *BULK* OF YOUR MATERIAL HANDLING

Payloaders are a proven, successful bulk-material-handling system in hundreds of fertilizer and chemical plants... are handling and rehandling loose materials fast and cheaply. They eliminate many slow, laborious and costly operations ... save time and labor and boost production.

Large pneumatic tires, short wheel bases and multiple speeds in both directions provide traction and maneuverability on or off hard floors, up ramps, through doorways and narrow aisles. It will pay *you* to find out how Payloaders can slash *your* material handling costs. See your Hough Distributor or write The Frank G. Hough Co., 703 Sunnyside Ave., Libertyville, Ill.



Send for catalogs on any size Payloader: the 12 cu. ft. Model HA; the ¾ yd. HF; the 1¼ yd. HL; the 1½ yd. HM. There is no obligation.

SAY HUFF

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Manufactured by THE FRANK G. HOUGH CO.

S. Rhodesia Phosphate

A large deposit of phosphate-bearing rock has been discovered near Dorowa, Southern Rhodesia. Investigators hope the new discovery may be exploited soon to satisfy all of the Southern Rhodesian requirements and some of the demands of the Union of South Africa.

Bill to Ration Fertilizers in South Africa

The Minister of Agriculture moved the second reading of the Fertilizer, Farm Feeds, Seeds and Remedies Amendment Bill in the closing days of the current South African Parliament. He recalled that the shortage of fertilizers during the war led to the setting up of a permit system. The feed position had greatly improved since the end of the war, and as a result of that the controls were lifted in 1948, but the fertilizer position remained difficult.

The new Bill was intended as a substitute for repealing the relative war measure, and to continue with the permit system for fertilizers and other necessary commodities wherever there was a scarcity. Bone meal, on which the stock farmers were so dependent, would now come under the permit system. The Minister said that the country's fertilizer requirements were about 650,000 tons a year, and during 1949 it was found that only about 400,000 tons were available for distribution. Since then, with increased supplies of the essential raw materials, local production had increased to about 480,000 tons and it was probable that before the current year ended it would be possible for the fertilizer factories to produce 500,000 tons this year, as a result of the opening of a new factory in Natal.

There was also a shortage of nitrates, representing 26 per cent of the amount required, and nitrates would therefore also have to be controlled. Though the Bill provided for the control of fertilizers, feeds, seeds and remedies, fertilizers and bone meal would be the commodities chiefly concerned.

It was not intended to continue rationing fertilizers indefinitely, but it was necessary to retain the power of control in case of shortages. If there was a greater import of fertilizers, the South African price would rise and with it the price of farm produce. The Government was trying to hold the balance by keeping down the price of fertilizers and so not adding to the cost of living.

Further shipments of nitrates are expected by fertilizer manufacturers who are expected to be fully occupied for some time with deliveries of this season's supplies of fertilizers to farmers.

The principal manufacturers of fertilizers in Southern Africa are African Explosives and Chemical Industries, Ltd., in which Imperial Chemical Industries, Ltd., is a large shareholder. This company recently raised some 33 million dollars in new capital, and a substantial part of this is being used to finance important developments in the fertilizer sections of its production.

Spanish Potash

According to a report from Madrid, the Spanish Ministry of Industry and Commerce on July 26, 1950 granted exploitation rights to the Instituto Nacional de Industria (INI) of potassium salt deposits in the Province of Navarra, consisting of about 19,000 hectares. According to the application made by INI to exploit these deposits, discoveries of rich veins of potassium salts have been made in the area by the Spanish Geological Institute. They are said to be close to the surface and conveniently located with regard to rail and highway transportation and not too distant from port facilities. Local contacts in the potassium-salts industry are of the opinion that it will be at least five years before mining of any sizeable commercial quantities will be effected in this area by INI, principally because of the tremendous expenditures involved in the purchase and installation of suitable mining machinery and transportation equipment.

Spencer Increases Southeast Sales Staff

R. K. Mullett F. N. Miller

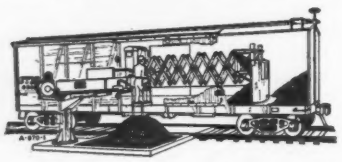
In expanding its new southeastern sales division, Spencer Chemical Company has announced the appointment of Floyd N. Miller as technical services specialist for the area, and Robert K. Mullett as representative for Alabama.

Mr. Miller, formerly connected with the Barrett Company and with Farm Fertilizers, Inc., will make his headquarters at the Atlanta office. Mr. Mullett will be located at Montgomery, Ala.

S-A Box Car Unloader

The Stephens-Adamson Manufacturing Company has recently added to its line a device for the quick and economical unloading of box cars.

The S-A Box Car Unloader handles grain, dry chemicals, sand, cement and practically all bulk materials, up to 2-inch lump size,



handled in box cars. A pantograph arm equipped with a scoop reaches into the car until it meets an obstruction, drops down and withdraws a load of material, discharging it to a trackside hopper. This cycle continues automatically, the single operator taking only enough time from other tasks to direct the arm to different sections of the car. A brush attachment snaps to the scoop for final clean out of the car. An unloading operation can be completed in only one-half man hour.

This new Unloader occupies an area of only 5′ 6″ by 14′ 2″ when not in use and requires only a single concrete footing for trackside mounting. Conventional rotary or tilting car dumps occupy considerably more space and require the operator's full attention at all times during the unloading cycle. Complete details on full, or semi-automatic, S-A Box Car Unloaders can be had by requesting bulletin 549 from the Stephens-Adamson Manufacturing Company at Aurora, Ill.

Junior—"Pa, the teacher says fertilizer stimulates plant growth like food makes boys and girls grow. Do you think it does, Pa?"

Farmer—"Can't say for sure, Son. I've never been able to understand whether the stuff actually stimulates the plants or whether it's just so downright repulsive that they try to grow away from it."

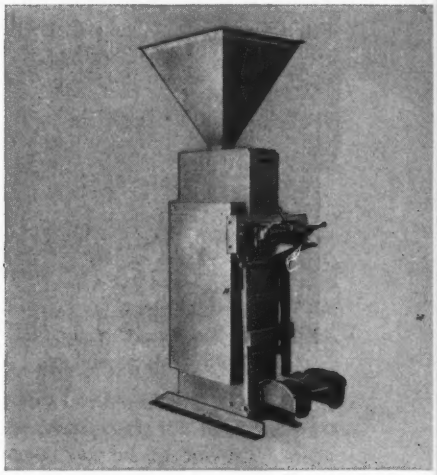
Alfalfa Stands Need Potash

Good vigorous second-year stands of alfalfa demand an adequate supply of potash, states R. H. Simon of the Ohio Station.

The first year's cuttings have utilized the potash from any previous manure topdressings and the small amount from the fertilizer on the previous grain crop. Potash from the soil minerals becomes available slowly, hence yields of the second-year stands of alfalfa are often limited by an adequate supply of potash.

As alfalfa requires four or five times as much potash as phosphoric acid, manure beyond the usual application would be required to satisfy this demand or the available supply of potash from the soil minerals will be depleted. On good, well-limed alfalfa soil, an annual fertilizer program is necessary to supply the continual demand of alfalfa for potash when high yields of good quality hay are desired.

PACKS UP TO 24 TONS PER HOUR!



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*REG. U.S. PAT. OFF.

▶ Here's the fertilizer packer you've wanted! An efficient, low-cost filling machine that packs 18 to 24 tons per hour, yet requires *only one operator* . . . the new St. Regis 325-PB.

▶ This dependable packer is designed, engineered and priced for the smaller plant, where volume does not warrant a machine of great capacity. It incorporates many of the outstanding features of the well known, larger-capacity 160-FB. Used in packing strong St. Regis Multiwall Paper Bags—it provides a packaging set-up that's certain to cut your production costs.

▶ *For complete details on the new, 325-PB filling machine, and ways it can help you, get in touch with your nearest St. Regis Sales Office.*

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YOU BUY PROTECTION WHEN YOU BUY MULTIWALLS

Mente Father and Son Team

The new Chicago sales office of Mente & Co., Inc., recently opened at 2425 Lawrence Avenue, will be in charge of George J. Loerzel, assisted by his son, George J. Loerzel, Jr. Mr. Loerzel senior has represented Mente & Co., Inc., New Orleans bag manufacturers, in the Chicago area for the past eleven years. Previously, he was consultant for the Industrial Engineering Society and with the manufacturing division of Marshall Field & Co. George J. Loerzel, Jr., was in the Army Air Force, and has a degree from the Iowa University.

G. J. Loerzel, Sr. and Jr.

NACA Annual Meeting at Spring Lake Sept. 6—8

The annual meeting of the National Agricultural Chemicals Association will be held at the Essex and Sussex hotel, Spring Lake, N. J., September 6 to 8. The program will feature the impact of the international situation on future availability of raw materials.

Dow Offers 20% Lindane

Dow Chemical Company, Midland, Mich., will offer a new, 20% emulsifiable formulation of lindane during the 1950 season. Lindane has been approved by the United States Department of Agriculture for use in dairy barns.

Double Forage Yields

If your soils are not in condition to grow legumes and grasses, you may easily double your production by adjusting the soil to the liking of these crops.

A. L. Lang, soils man in the Illinois College of Agriculture, said today the first step in getting good stands and high yields of forage crops is to seed them only on land well supplied with limestone. Strongly acid soils need 3 to 4 tons of lime to the acre.

The second step is to make sure the soil is well supplied with phosphorus and potassium. You can get this information from soil tests and from studying previous crop rotations and soil treatments.

You can supply phosphorus through rock phosphate, superphosphate, or mixed fertilizers. The important thing is to use plenty of whatever source you select. When you apply enough phosphorus to do the job on the small grain nurse crop and legume seeding, it returns more per dollar invested than when applied any other place in the rotation.

You can put on 1,000 to 1,500 pounds of rock phosphate an acre and disk it in thoroughly before seeding. This one application should last 10 to 15 years. Or you can put on 300 to 500 pounds of superphosphate every 3 or 4 years. Mixed fertilizers may be a pretty expensive way to apply phosphorus unless your soil needs the other plant foods in the fertilizer too.

Forage crops need more potassium than we usually suspect. If your soil needs it, apply plenty. The usual recommendation is 200 pounds of muriate of potash an acre.

Lang adds that nitrogen, magnesium, boron, and some trace elements are often offered for sale with a great many promises that are not commonly realized on Illinois soils.

OBITUARY

Frank Phillips

Frank Phillips, who retired in 1949 as chairman of the board of the Phillips Petroleum Company, Bartlesville, Okla., which he founded in 1917 died, in Atlantic City, N. J., August 23. He was seventy-six years old.

In 1917 Mr. Phillips organized the Phillips Petroleum Company to handle his large oil holdings and, through the company, later began refining and retailing gasoline. The company's retail gasoline, under the brand name "Phillips 66," became a leaidng seller throughout the southwest.

In addition to usual petroleum business, the company is the largest producer of liquefied gas, mainly butane and propane, used for commercial, industrial and public utility purposes. Through a wholly-owned subsidiary, Phillips Chemical Company, it operates the world's largest furnace black plant, at Borger, Tex.; a plant for the manufacture of anhydrous ammonia, located sixty miles north of Amarillo, Tex., and an ammonium sulphate plant at Port Adams, Tex.

After having been chief executive officer, chairman of the board and president for twenty years, Mr. Phillips recommended in, 1937, that K. S. Adams, executive vice president, be elected president. Mr. Phillips remained chairman until 1949, in which year he became honorary chairman and an honorary director.

Peanut Insecticide Held Unsafe

A WARNING that benzene-hexachloride and Lindane are unsafe for insecticidal treatment of peanuts has been issued in North Carolina by L. Y. Ballentine, Agriculture Commissioner.

Experiments have shown that the use of these materials on peanuts resulted in a "disagreeable taste and odor" in the nuts, Ballentine said in a letter to fertilizer manufacturers and dealers. He requested their cooperation in meeting "this important problem affecting our peanut growers."

He also disclosed that when benzene hexachloride is applied to cotton for control of boll weevils it may leave a sufficient residue to affect peanuts grown as a succeeding crop.

Release of this information followed a conference between representatives of the North Carolina Experiment Station, the Extension Service and the Department of Agriculture. Similar conclusions were reached at a recent meeting of agricultural leaders and the Carolina-Virginia Peanut Association at Suffolk, Va.

A. Hugh Harris, Assistant Commissioner of Agriculture, said he had been informed that one method of applying benzene hexachloride to peanuts was by mixing it with fertilizer for use on the crop. As a precautionary measure, he contacted the principal fertilizer manufacturers serving North Carolina, he added, and learned that this combination fertilizer-insecticide had been prepared only on a limited scale for research purposes and that none had been shipped into this state.

Ballentine's letter to the fertilizer industry stated:

"In order that the future of the peanut industry in North Carolina not be jeopardized by improper insect control practices your attention is called to the following:

"1. Experiments conducted by the North Carolina Agricultural Experiment Station have shown that a disagreeable taste and odor have resulted from the use of benzene hexachloride to control insects attacking peanuts.

"2. The residue of benzene hexachloride used on cotton for boll weevil control may be sufficient to produce unfavorable effects on peanuts grown in the rotation.

"3. Representatives of the North Carolina Agricultural Experiment Station, Extension Service, and State Department of Agriculture have recently conferred on this subject. The group considers benzene hexachloride, the technical grade or the purified form known as Lindane, unsafe for insecticidal treatment for peanuts. This is in agreement with conclusions reached by a similar group from Virginia who met a few days ago. It is also in accord with a recent resolution passed by the Virginia-Carolina Peanut Association.

"4. On cotton grown in rotation with peanuts, 20% Toxaphene dust or a 10% Chlordane dust should be used as recommended in N. C. Extension Circular 312.

"5. As new information on this problem is developed, the recommendations may be modified. We will keep you advised of any significant findings on this important subject.

"We solicit the cooperation of the fertilizer industry on this important problem affecting our peanut growers."

Arasan Seed Disinfectant

When used in treating legume seeds it enables plants to start building up soil nitrogen sooner and encourages faster growth of accompanying grasses, it is stated by R. E. Krenzin, agronomist at Iowa State. For protection against root rot and other seedling diseases in grasses, tests at the North Dakota station advise using 8 ounces of Arasan dust per 100 pounds of seeds of various wheat-grasses, brome, big bluestem and other grasses. Purple stain disease of soybeans is controlled by Arasan reports the North Carolina station where treated seed had an emergence of 97 per cent compared with 75 per cent for untreated seed.

Lethane Use in Aerosols

Research leading up to the use of lethane in aerosols was described by J. P. Nichols of the Agricultural & Sanitary Chemicals department of Rohm & Haas Company, Philadelphia. This work, he said, produced a basic cost formula of 4 per cent "lethane 384," 0.1 per cent pyrethrins and 2 per cent DDT later, indicated by the Department of Agriculture as eligible for licensing under its aerosol patent.

"Thus, by definition," he said, "4 per cent 'lethane 384' adequately replaced 75 per cent of the pyrethrins content of TOTA, the aerosol industry's Tentative Official Test Aerosol containing 0.4 per cent pyrethrins and 2 per cent DDT. The above lethane formula, with 0.25 per cent piperonyl butoxide added, is also eligible for licensing and is being used in a number of brands this year."

The world is full of happiness and plenty to go round, if you are willing to take the kind that comes your way. The whole secret is in being pliable.

From The Experiment Stations

New Pennsylvania Crop Study

A new research study to determine if essential elements may be lacking in feed crops produced in Pennsylvania, has been launched by Penn State scientists through a special grant received recently. The grant of $20,000, covering a 3-year period, was made by the Limestone Products Corporation of America, Newton, N. J.

Trace elements like cobalt, manganese, and copper in timothy, red clover, and oats will be studied to start the new research. Samples will first be taken in areas where animals have been found suffering from diseases caused by deficiency of these essential elements. The project is under the Pennsylvania Agricultural Experiment Station, of which Dr. F. F. Lininger is director.

Corn Needs Nitrogen

About 150 pounds of nitrogen is needed to make a crop of corn that will yield 100 bushels per acre.

This is a reminder from Wilber Ringler, extension soils specialist at the University of Nebraska. As a rule, he says, the best time to apply nitrogen is after the corn is above the ground. Applying at the second cultivation or when the corn is more than a foot high usually brings good results. Other points from Mr. Ringler:

Nitrate can be applied either through cultivator attachments or with a broadcast spreader. But if a broadcast spreader is used, holes over the corn should be plugged. If the nitrate falls on the plant it will cause some damage. An end-gate seeder should not be used for applying fertilizer to corn—"the nitrate must be put on the ground, not on the plant."

The recommended rate of applying nitrogen, Mr. Ringler says, will vary with the cropping history of the land. On land which has not been in alfalfa or clovered ring the past year, 40 to 60 pounds of nitrogen per acre usually pays off. On irrigated land 60 to 80 pounds of nitrogen may be used.

Two and One-Half Cents for Fertilizer

Increases in beef cattle gains due to fertilizing pastures have ranged from 16 to 72 per cent, for various treatments on three different soil types, at the Southeast Oklahoma Pasture-Fertility Research Station. For all treatments, the cost of fertilizer for each extra pound of beef has been about two and one-half cents. Results are summarized in Bulletin B-348, recently published.

Nitrogen Test

Recently some sugar beet growers have been running a test for nitrogen on beets during the growing season and if the nitrogen is needed, they side-dress it on. According to Paul Rood, extension soils specialist at Michigan State College, the test consists of cutting or crushing the fleshy stem of beet leaves and applying a white powder. If the powder does not turn pink, then there's a need for nitrogen. In one experiment, application of the fertilizer on beets which needed nitrogen increased the yield two and one-quarter tons per acre at a cost of six dollars per acre for the fertilizer Where alfalfa and sweet clover are in the rotation this additional application of fertilizer is generally not needed.

As Fertilizer Potatoes Equal Value of Manure

How much are potatoes worth as fertilizer?

After a little calculation, Paul Rood, Michigan State College soil scientist, came up with this answer. About as much per ton as average farm manure. This may help some fertilizer salesman on his next trip.

The question came to Rood by long distance from a farmer who said he could buy surplus potatoes at one cent a hundred. Rood figured out that a ton of potatoes would have 7 pounds of nitrogen, 2.5 pounds of phosphoric acid and 10.5 pounds of potash—worth about $1.85.

Rood put his answer this way to AMERICAN FERTILIZER. You have the manure in your barn and it has to be hauled out. So it costs you only the loading, hauling and spreading. Potatoes, too, would have to be loaded, and if bought some distance from the farm the hauling cost would be greater. They, too, have to be spread. You also have to pay 20 cents for the ton of potatoes.

At the same time, Rood warned, potatoes with any disease could carry that disease to the soil.

It would take only 68 pounds of a commercial fertilizer to give the same plant foods of equal value to the nitrogen, phosphate and potash in a ton of "spuds."

So what you should do about buying potatoes from somewhere off your farm for fertilizer only should be easy to figure out. If, however, you grow potatoes and the government has bought them at support prices and offers to sell them to you at one cent a hundred, your problem is different. You have to get them out of your storage house. So it offers about the same problem as getting the manure out of the barn.

Fertilizer Papers

(*Continued from page 9*)

the latter, especially when making available calcium and sulphur of the latter especially when making recommendations for podzolized soils.

Effects of Incorporations of Certain Carriers of Fluorine Upon its Concentration in Crops and Lysimeter Leachings

W. H. MacIntire, S. H. Winterberg, L. B. Clements and Brooks Robinson, University of Tennessee Agricultural Experiment Station, Knoxville, Tenn.

Incorporations of sodium fluoride, sodium silicofluoride, magnesium fluoride, cryolite, and rock phosphate were made in quadruplicate in 56 lysimeters of 1/10,000 acre to supply fluorine at initial rate of 300 pounds per acre 3,000,000 pounds of soil, 9-inch depth, on limestoned Hartsells loam and Clarksville silt loam. Three of the four lysimeters allotted to each fluorine carrier on each soil then were seeded to soybeans and the fourth lysimeter of each series was kept fallow. Following soybeans, 675-pound supplements of fluorine were incorporated into the upper 4½inch zone of soil in the several lysimeters before the seeding to lespedeza, the second crop. After lespedeza, every 9-inch placement of soil was removed and the previous incorporations were mixed full depth before the seeding of spring oats, the third crop.

No enhancement in the fluorine content of the vegetation resulted from the incorporation of any fluorine carrier on the limestoned soils, even though the carriers supplied a 975-pound input of fluorine. Incidence of fluorine was virtually constant in the respective crops of soybeans, lespedeza, and oats, on the two soils.

Fluorine outgo from the Hartsells soil was small, although significant, for every 300-pound input of that element, the exception being the input carried by and the nugatory outgo from rock phosphate. Every fluorine outgo from the 300-pound incorporations in Clarksville was twice the corresponding outgo from Hartsells. Fluorine leachings from both soils were enhanced greatly after the 675-pound supplement that resided in the upper zone was mixed into full depth and each two-year migration from Clarksville was from three to four times the corresponding migration from Hartsells. Sodium fluoride induced the largest outgo of fluorine from both soils. The difference between the extent of fluorine drainages from the 975-pound aggregate incorporations of fluorine as cryolite, as magnesium fluoride, and as sodium silicofluoride are not deemed significant for either soil. The maximal occurrences of fluorine in the year's leachings from the 300-pound input of that element were *0.43* ppm and *0.96* ppm from cropped Hartsells and Clarksville, respectively, with attendant outgo of *1.88* pounds and *3.99* pounds of fluorine per acre 3,000,000 pounds of soil; whereas the highest concentrations induced by the 975-pound input were *1.18* ppm and *5.18* ppm in Hartsells and Clarksville, with resultant migrations of *8.02* pounds and *29.68* pounds of fluorine per acre of 9-inch depth. The leachings have not registered appreciable differences in the migrations of fluorine from the cropped and fallowed soils.

Minor Elements

(*Continued from page 7*)

the use of micro-nutrients, particularly in a water-soluble form, are the organic gardeners. In reality, organic gardeners are advocating supplying both the major and minor nutrients in organic matter, a non-toxic form. When organic matter in the form of composts or mulches is returned to a soil so as not to overstimulate the soil microorganisms, it is really equivalent to returning all of the nutrients—both the macro and the micro element—in somewhat the same quantities as they are needed by the growing crops. Since many users do not have available composts, mulches, etc. to supply nontoxic carriers of micro and some macro nutrients, many sources of water-insoluble macro- and micro-nutrients have come on the market. Usually these materials have been ground-up rock, feldspar, glauconite, and various waste minerals. Unfortunaetly, many of these materials carry only a few micro-nutrients and often in not the correct ratio or proportion as required by plants. Some are far superior to others. Many excellent results have been obtained by their use. The water-insoluble carriers are approaching the natural forms found in the soil. They should be less expensive, easier to mix in fertilizers, and more fool-proof in use. If and when we learn the proper combination of the water-insoluble compounds and discover a suitable source for these combinations of raw materials, we may have the answer to our minor element fertilizer problem.

Each year the fertilizer producer has more demands for micro-nutrients. This will probably continue until a fertilizer containing all the micro- as well as the macro-nutrients needed for plant growth is available. Such a fertilizer will have to approach a complete plant nutrient carrier in a form or condition which will supply the requirement of a large number of economic plants and at the same time not be overly expensive. If some such solution is not made for this minor element problem, the producer may find that he is either making so many special fertilizer mixtures that it is either not economical or that his product is not stimulating the crop growth expected. Although this is probably not an ethical or orthodox way of handling this minor element problem from the research and scientific view point, some similar solution will no doubt have to be made by the producer to supply the need of the average fertilizer user. The producer should have a product which is not too difficult or expensive to produce, can be used easily and safely by the farmer, will give good crop increases, and be profitable to produce or sell. This is a difficult order to fill. There are, however, many materials that might be properly prepared and used as a start towards the solution of this micro-nutrient problem.

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- Koppers Co., Inc., Tar Products Div., Pittsburgh, Pa.
- Lion Oil Co., El Dorado, Ark.
- McIver & Son, Alex. M., Charleston, S. C.
- Northern Chemical Industries, Inc., Searsport, Me
- Phillips Chemical Co., Bartlesville, Okla.
- United States Steel Corp., New York City
- Woodward & Dickerson, Inc., Philadelphia, Pa.
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- Northern Chemical Industries Inc., Searsport, Md.
- Southern States Phosphate Fertilizer Co., Savannah, Ga.
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SUPERPHOSPHATE
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- McIver & Son, Alex. M., Charleston S. C.
- Northern Chemical Industries, Inc., Searsport, Me.
- Southern States Phosphate Fertilizer Co., Savannah, Ga.
- Summers Fertilizer Co., Baltimore, Md.
- U.S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
- Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE—Concentrated
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- International Minerals & Chemical Corporation, Chicago, Ill.
- U.S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
- Virginia-Carolina Chemical Corp., Richmond, Va.

TANKAGE
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- Ashcraft-Wilkinson Co., Atlanta, Ga.
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- Davidson Commission Co., The, Chicago, Ill.
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